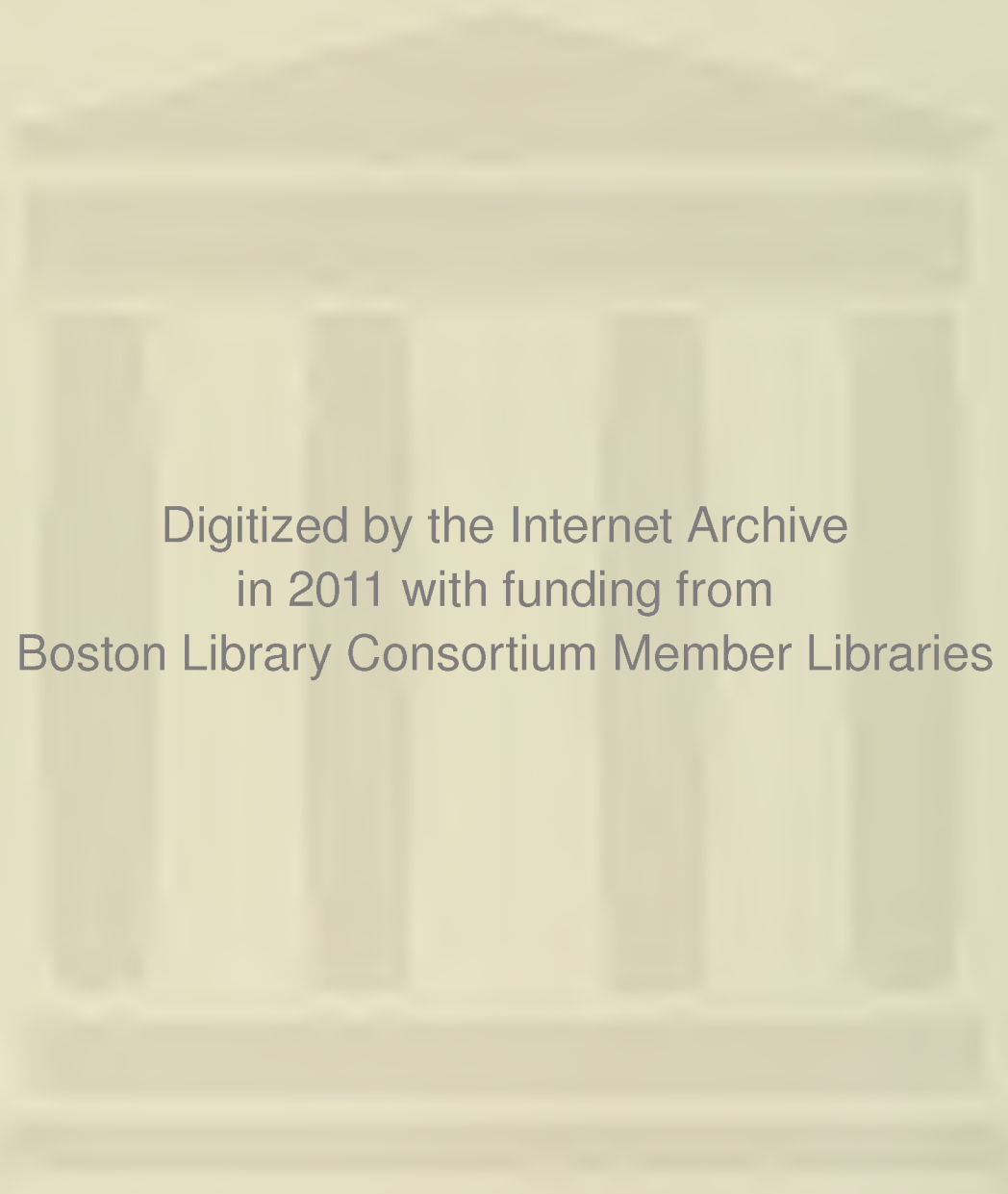

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PROFIT-SHARING VERSUS FIXED-PAYMENT CONTRACTS: EVIDENCE FROM THE MOTION-PICTURES INDUSTRY

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Abstract

The choice between sharing and fixed-payment compensation schemes is examined using data on contracts from the motion-pictures industry. The data support the hypothesis that share contracts mitigate the negative efficiency effects arising from hidden action and hidden information. Furthermore, the data provide only weak support of the risk-sharing alternative explanation for the choice of a share arrangement.

Profit-Sharing Versus Fixed-Payment Contracts: Evidence from the Motion-Pictures Industry

I. INTRODUCTION

Why do some film actors receive a fixed payment for their performances while others receive a share of the output? One explanation is that the disincentive effects arising from hidden action and hidden information are mitigated by share arrangements. Another is that the producer and actor are sharing risk. The moral hazard argument is strongly supported by data from the U.S. motion-pictures industry.

An actor's payment will be tied to the output when the positive incentive effects justify the costs of implementing and enforcing the relatively complex sharing agreement. Empirical proxies of these benefits are presented and tested using a sample of contracts between actors and producers. The evidence supports the hypothesis that when the expected benefits from a higher level of effort by the actor are larger, a share contract is more likely to emerge. Furthermore, the empirical results provide only weak support of the risk-sharing hypothesis.

Section II provides a detailed description of the contract data set. Section III presents definitions of variables and empirical predictions. Section IV discusses the empirical methodology and results, while Section V offers conclusions and suggestions for future research.

II. The Data Set Described

The data on contractual compensation schemes were collected at the Margaret Herrick Library in the Academy of Motion Picture Arts and Sciences in Beverly Hills, California. The library maintains extensive files, organized by topic, containing clippings from film-industry journals and general periodicals that pertain to the particular subject of the file. Contract information came from the following folders: *Actors & Actresses: Contracts and Clauses; Actors & Actresses: Salaries; Contracts;* and *Profit Participation.* Among the journals and periodicals referenced in these folders were: *Daily Variety; Weekly Variety; Hollywood Reporter; Screen International; The Wall Street Journal;* and *The New York Times.*[1] The search resulted in the collection of 118 payment schemes.

The folders described above actually contained contract information on 140 agreements. However, the exclusion of 22 of these observations was justified for several reasons. Twelve observations were dropped since the contracts were written before 1959. Since long-term contracts dominated the industry during the Age of the Studio, 1929-48, and the transition to a Free Agency system occurred during the ten years following the *Paramount* decision of 1948, contracts during the period before 1959 may reflect the incentives from the previous regime (De Vany and Eckert (1991), Chisholm (1993)).

Five data points were excluded due to the fact that the actor was also the producer, thereby removing the potential for moral hazard. Two observations were dropped since they involved television films, which are subject to different incentive effects than feature releases. Two more observations were omitted since there was no cast credit information. In one case, the film was not a major release (it did not appear in the *Annual Index of Motion Picture Credits*)

and the universe of contracts for the present analysis is major U.S. releases. In the other case, the film was too recent for its cast and credit information to be listed in the *Index*. A final observation was dropped, since the actor's history involved foreign films to a significant extent. The remainder of observations comprised the data set used in the empirical analysis of Section IV.

III. Variable Definitions and Empirical Predictions

A risk neutral producer will offer a risk neutral actor an optimal contract, which maximizes the expected profit of a given film.[2] If transaction costs are zero, the actor will receive a share contract for which the share equals 100 percent. As the residual claimant, the actor will choose the optimal level of effort.[3] However, since effort is costly to monitor, and a share contract is more costly to draft *(ex ante)* and to enforce *(ex post)* than a fixed-payment contract, the producer will weigh the benefits of providing the right incentives against the transaction costs of the share agreement.[4] The larger the benefits from mitigating moral hazard, the more likely a share contract will be offered. Empirical proxies of the value of a share contract are presented, along with refutable hypotheses on their impact on the likelihood of a share contract emerging.

Sequels and Oscars

Consider first the significance of an actor's role in the case of a sequel. The main character in a film with many sequels becomes the dominant contributor to the film's characteristics. For example, in the Rambo film series, the character played by Sylvester Stallone has become

legendary to many viewers. Since the character plays such a crucial part in the success of the film, even the smallest change in performance can have a potentially large impact on film attendance. The refutable implication is that the likelihood of a share contract emerging will increase if the film is a sequel, since a small decrease in effort level by the actor could lead to a significant loss of revenues. A similar effect and result will hold for actors who have received Oscars or Oscar nominations in the past.

Empirically, the SEQUEL variable equals one if the film is a sequel, and zero otherwise. The OSCAR variable represents the total amount of Academy Award recognition an actor has received. Recognition includes both winning an Academy Award and having been nominated. *60 Years of the Oscar: The Official History of the Academy Awards* was employed to construct an Oscar history for each actor.[5] The model predicts that a larger OSCAR measure will increase the likelihood of the producer offering a share contract.

Actor's Experience

The actor's experience will impact contract design in an analogous manner as Oscar recognition. Furthermore, self-enforcing reputational concerns will lead to higher levels of effort chosen by actors with less experience, reinforcing the implication that an actor with more experience is more likely to receive a share contract.[6] The ACTEXP variable measures the number of past films in which the actor has had at least a principal role. This variable was constructed using various annual editions of *The International Motion Picture Almanac* and *Halliwell's Film Guide.* The model predicts that the number of films in which an actor has performed will have a positive impact on the probability of a share arrangement emerging.

Contract Length

Films requiring lengthy production times involve large degrees of production complexity.[7] Many individuals contribute to the ultimate financial success of such a film, including the cinematographer, sound editor, director, and others who are literally behind the scenes. Since the actor knows that the producer's monitoring costs increase with the number of contributors to the final output, the actor is more likely to shirk. Tying the actor's payment to the output will provide the actor with the incentive to exert a higher level of effort, in a circumstance in which the probability of shirking would otherwise be high. Such an agreement will mitigate the incentive of the actor to "hide" his shirking behind the many sources of effort. A share agreement will be more likely to emerge the longer the contract length.

The LENGTH variable measures the shoot time for a film, from the starting shoot date to the closing shoot date. This information was available in clippings and on microfiche in the *Production Notes* for each film at the Academy of Motion Pictures. In some cases, the starting date of production was known, but only the film completion date was available. Therefore, the first logit analysis of Section IV uses only the observations for which contract length was known (Regression I). The other regressions use two-stage estimation techniques to reinstate excluded observations, the details of which are discussed in Section IV. The model predicts that a longer contract length will increase the probability of a share arrangement emerging.

Prior Collaborations

When the producer offers an actor a contract for the first time, the actor will have private information about his type (high talent or low talent) and his level of effort. After the first film

is produced and exhibited, the producer will acquire more information about the talent of the actor, based, in part, on the success of that film. If the producer chooses to work with the actor again, the producer must believe that it is profitable to do so. Therefore, a producer collaborating again with an actor reveals a belief that the marginal contribution of this actor to the success of the current film, *ceteris paribus,* will be larger than another star's contribution. This insight derives from the detailed information the producer has acquired about the contribution of the actor's past performance to the success of the previous film. Since the actor's effort level is costly to observe, but the benefits of his talent are known to the producer, and on the margin will be relatively large, the producer will tie the actor's payment to the output to elicit the optimal level of effort. Therefore, a share contract is more likely to emerge if the producer and actor have collaborated in the past.

The TEAM variable is equal to one if the actor and producer have worked together in the past, and zero if they have not. The filmographies of actors and producers were compiled from the same sources involved in deriving the ACTEXP variable. The model predicts that TEAM should have a positive impact on the probability of a share contract being offered, since it will mitigate the disincentive effects of hidden action by the actor.

Past Revenues

The producer can examine the revenue of the most recent film in which the actor has had a principal role. The producer will take this (imperfect) measure of past performance as a signal of the actor's talent. Since the opportunity cost of a talented actor shirking is higher than that

of a less talented performer, a higher past (real) revenue will increase the likelihood that a share arrangement is offered.

The PASTREV variable measures the real revenue of the actor's most recent film. In order to research the revenues of past films, the dates of release had to be determined. Max Joseph Alvarez's *Index to Motion Pictures Reviewed by Variety, 1907-1980* provided review dates for films prior to 1981; and various annual editions of John Willis' *Screen World* revealed the month and year of release of films beyond 1980. Once the approximate date of release was established, data on revenues were collected. *Variety* magazine tracks revenue data for films, generally on a weekly basis. The primary source of revenue information was *Variety's* May 4, 1992 listing entitled, "All-Time Film Rental Champs," which gave revenue information on all films, distributed in the U.S. and Canada, that generated a nominal $3 million or more in rentals.[8] These revenue data were then adjusted for inflation to construct the PASTREV variable. The model predicts that a larger PASTREV will increase the probability of a share contract emerging.

Film Genre

The value of higher levels of effort will vary across film genres and so should optimal contract design. The success of an action film is based in large part on the impressiveness of its special effects. A higher level of effort by the actor can be obscured by the technical activity within such a film. The marginal value of tying the actor's payment to the output will be relatively low, implying that a share contract is less likely to emerge for an action film. The success of a comedy, however, relies more on the actor's talent and effort exerted in delivering his lines. The

comic lead must practice his timing, intonation, and delivery; the harder he works at this, the more successful the film will be. An actor starring in a comedy should be more likely to receive a share contract.

The importance of an actor's effort in a drama is similar to that in a comedy, since the success of a drama relies mostly on the actors' performances rather than on special effects. However, in addition to depending upon an individual actor's effort, the success of a drama depends on the interaction between or among the lead actors.[9] Therefore, the incentive effects for a drama work in two directions. The producer will gain by tying the individual actor's payment to the output, which leads to an increased likelihood of a share contract emerging. However, since this logic applies to all of the lead actors, the share that each actor receives will be diminished, making a share contract less likely to emerge. The predicted sign for a drama is indeterminate.

The genre of most of the films in the data set was determined by consulting *The Video Source Book, 13th Edition,* and *Halliwell's Film Guide, Eighth Edition.*[10] For some films, the *Source Book* contained two or three genre descriptions (for example, "Comedy/Comedy-Drama/Crime & Criminals" appeared for one film). In such a case, the genre listed first was taken to be the genre of the film. This decision rule appears to be consistent with the intent of the publisher of the *Source Book.* In order to prevent the problem of multicollinearity, genres were further compressed into three categories: ACTION, COMEDY and DRAMA.[11] These genre variables equal one when a given film falls in that category, and zero otherwise. The coefficient on ACTION should be negative, on COMEDY positive, and on DRAMA indeterminate.

Gender

Approximately 70 percent of lead and principal roles are held by actors versus actresses.[12] The apparent low availability of female roles implies a greater degree of competitiveness among actresses than actors. The corresponding self-enforcing reputational mechanisms will lead to higher levels of effort by actresses. Therefore, a producer is more likely to tie payment to the output when the performer is male. The GENDER variable equals one for an actress, and zero for an actor.

Trend and Timing Effects

The TREND variable simply reflects the year in which the film was produced. It is included to account for the possibility of a trend over time in the optimality of one contract form over the other. Careful industry observers would probably argue that there has been a gradual trend towards more sharing arrangements. Therefore, the prediction is that TREND should be positively related to the likelihood of a share arrangement being offered.

The HOLIDAY dummy variable is included to control for the timing of the film's release. For films released between 1982 and 1989, *Art Murphy's Boxoffice Register* provided release dates; for films released between 1959 and 1981, release dates were determined by consulting Alvarez's *Review Index.*[13] Alvarez documents the date the review for the film appeared in *Variety,* which generally appears the Wednesday after a Friday opening. If the film was released within six days prior to and including a holiday, HOLIDAY equals one, otherwise it equals zero.[14]

IV. EMPIRICAL METHODOLOGY AND RESULTS

The choice between a share versus a fixed payment involves an observed dichotomous choice, based on an underlying continuum of shares, ranging from zero to one. Empirically, the SHARE variable represents the choice of contract form by the producer. Within the Academy's file folders on compensation, sometimes a clipping simply stated that an actor received "points." Such a statement implies that an actor received a share arrangement, but it does not reveal the size of the share or the nature of the share (i.e., a share of the profits versus revenues). These limitations require that the SHARE variable be represented as dichotomous rather than continuous, equal to one if the actor received a share contract, and zero otherwise. The appropriate empirical analysis of these data, therefore, required limited dependent variable techniques.

A. Econometric Considerations

One specification of the error term would involve a Weibull distribution, as in a duration model (Heckman and Singer (1984)), addressing the fact that the underlying share variable, giving rise to the observed dichotomous choice, is constrained to nonnegative values. Such a formulation estimates the probability that an actor is in a certain state (e.g., receives a share contract), *given* the previous state. The present theory and data, however, are suited for estimating unconditional probabilities rather than Markovian transition probabilities, since for most observations, the previous contract state is unknown.

Another possible specification would involve the tobit model. Given the assumption that a fixed-payment contract will emerge when the optimal share value is below some critical s^*, one

could argue that the present sample of contracts is censored, and that the left-hand side variable should be treated as continuous. Share values above the critical level s^* could be used to infer missing values below s^*. The data, however, do not allow for this estimation technique, since for many of the share contracts for which the share presumably exceeds s^*, the size of the share is unknown.[15]

Given the infeasibility of implementing the specifications described above, the logit model appeared best suited for the present analysis. One limitation of the logit model is that it treats the underlying share variable as ranging from negative to positive infinity, when it actually ranges from zero to one. This choice of specification, however, is standard in the empirical contract literature. For example, examining cropshare contracts, Allen and Lueck (1993) employed a logit analysis for the case in which the underlying share, determining contract form, was constrained between zero and one. Furthermore, Crocker and Masten (1993) used a probit model in their analysis of contractual completeness in air force procurement contracts, acknowledging that the choice of contract design was driven by the underlying, continuous degree of contractual completeness, limited also to nonnegative values. Therefore, the following equation was estimated using the logistic distribution:

$$\begin{aligned} SHARE_i = {} & \beta_1 + \beta_2 SEQUEL_i + \beta_3 OSCAR_i + \beta_4 ACTEXP_i + \beta_5 LENGTH_i + \beta_6 TEAM_i + \\ & \beta_7 PASTREV_i + \beta_8 COMEDY_i + \beta_9 DRAMA_i + \beta_{10} GENDER_i + \beta_{11} TREND_i + \\ & \beta_{12} HOLIDAY_i + \varepsilon_i \end{aligned} \qquad \text{EQ-1}$$

B. Implementation of Estimation

Equation 1 was estimated using various subsamples of the data set. Since some observations in the data set were missing explanatory variables, two-stage estimation techniques were required. Table 1 documents the results of a series of estimations, which led to the inclusion of an increasing number of observations.[16]

Regression I estimated Equation 1 using all observations with no missing explanatory variables, leaving a sample of 44 observations. Regression II reinstated eight more observations by estimating missing contract lengths in the following manner. For these eight observations, the starting shoot date for the film was found in the *Production Notes,* but the ending shoot date was not; only the film's completion date was known. Therefore, for the cases in which the start shoot date, end shoot date, and date of completion were known, a least squares estimation was performed, with contract length from shoot start to completion as the independent variable, and contract length from shoot start to shoot finish as the dependent variable. Using the predicted values from this regression, the missing contract lengths were estimated.

Regression III involved a sample comprised of the core sample from Regression I, plus nine observations with missing past revenues estimated in the following manner. Since the *Rental Champs* list described in Section II did not contain past revenue information for all observations, an alternative source of revenue information was consulted. From 1969 until at least 1989, *Variety* documented the 50 Top-Grossing Films on a weekly basis.[17] This chart listed a cumulative total of revenues (rentals) received by the film to date, among other data. Data were collected from these weekly listings for missing films, as well as for films that appeared on the *Rental Champs* list. This allowed for a conversion of data collected on the weekly basis to the

same order of magnitude as that gathered from the *Rental Champs* list. These estimates of PASTREV reinstated nine observations.

Regression IV involved a sample comprised of the core sample from Regression I, plus observations with *both* LENGTH and PASTREV estimated, using the methods described in Regressions II and III. Since this sample still included less than half the data set, an alternative method of estimating missing variables was considered. In particular, the validity of substituting the mean contract length for missing LENGTH information was examined in the following manner. Equation 1 was re-estimated, using the observations from the core sample in Regression I, plus observations only missing LENGTH data. For these additional observations, LENGTH was set equal to the mean contract length of Regression I. A dummy variable, TIMEMISS, was added to Equation 1, to identify missing values. The results of this analysis only differed marginally from those of Regression I, validating the substitution of the mean contract length for missing LENGTH values.[18] Regression V estimated Equation 1 using the core sample, plus observations with missing past revenues estimated as in Regression III, and with the mean contract length used for observations missing the LENGTH value.[19] Analysis of these regression results follows.

C. Interpretation of Results

Two variables significant across all five regressions are LENGTH and ACTEXP. LENGTH is positive and significant at the .05 level in four cases, and at the .10 level in one case. A positive coefficient on the LENGTH variable implies that a share contract is more likely the longer the production time of the film. This result is consistent with the fact that the costs of monitoring

an actor increase with a larger number of contributors in the production process, increasing the likelihood of a share contract being offered. A positive and significant coefficient on ACTEXP provides support for the argument that the self-enforcing reputational concerns of an actor are stronger earlier in his career. Losses arising from shirking are more likely to occur the more experienced the actor, making a share contract more likely later in an actor's career.

Two variables significant across four of the five regressions are PASTREV and GENDER.[20] The positive coefficient on PASTREV, significant beyond the .10 level in four cases, demonstrates that a share contract is more likely to emerge the larger the real revenue of the actor's most recent film. This result supports the argument that the opportunity cost, in terms of expected lost revenues arising from shirking, will be larger the more profitable the actor's most recent performance.[21] The negative coefficient on GENDER, significant at the .05 level across four regressions, implies that a (female) actress is less likely to receive a share contract than her male counterpart. This result is consistent with the hypothesis that the higher degree of competitiveness for female leading roles leads to stronger self-enforcing reputational effects among actresses than among actors.

Both OSCAR and TEAM are significant beyond the .10 level in three of the five regressions. The positive coefficient on OSCAR implies that an actor with more Oscar recognition is more likely to receive a share agreement. This is consistent with the prediction of the model, based on an argument analogous to that posed for the PASTREV variable. The positive coefficient on TEAM suggests that repeat collaborations are more likely to lead to share arrangements than first-time collaborations. This result supports the argument that the value of

eliciting a higher level of effort from an actor, with known talent, is worth the cost of designing and enforcing a share arrangement.[22]

The COMEDY variable is significant at the .05 level for three of the regressions. This result is consistent with the prediction that when the success of a film depends more on the effort of the actor (in delivering comic lines, as opposed to appearing in an action setting, dominated by special effects), an actor is more likely to receive a share arrangement. That the coefficient on DRAMA is not significantly different from zero suggests that in a DRAMA, the positive incentive effect of higher individual effort may be offset by the division of a fixed pie among the other lead performers, whose interaction *together* leads to the success of the film.[23]

D. Multiple Observations and Non-Spherical Errors

Since a subset of actors appears in the data set more than once, the error terms may be correlated across these actors' contracts. In most cases, however, the contract information is on movies at distinctly different points in each actor's career. These observations can be treated as cross-sectional, with ACTEXP controlling for the point in the actor's career at which each contract was designed.

The problem of non-spherical errors may enter in the case of back-to-back films. If for a given actor, the contract of the current period is known, as well as the contract from the previous period, then there is a chance that the error terms are correlated. There are only six instances for which the current contract and the most-recent contract are known. One way to adjust the error terms would be to use the method proposed by Guilkey and Murphy (1993), which involves the probit (logit) analog of the White consistent covariance matrix correction.

This technique essentially involves stacking the observations that may be correlated, and correcting for serial correlation. Due to the small number of observations to which this issue applies, and the lack of meaningful variability arising from these points, an alternative adjustment was employed.

In order to examine the impact of these six cases of contiguous contracts, the observations corresponding to the current contracts were dropped, and the Regressions of Table 1 were run on the remaining sample.[24] The selection bias presented in doing so would most strongly affect the ACTEXP variable; by dropping observations appearing later in these actors' careers, the experience variable would be underrepresented. The results of Regression V, using this subsample, led to coefficients with the same signs as those in Table 1, Regression V, except for TREND, which changed from negative to positive, while remaining insignificant. All of the variables that were significant in Table 1, Regression V, remained significant in this subsample, and vice versa.[25] If there were some serial correlation in these error terms, it had virtually no impact on the summary results of Regression V.[26]

E. The Risk-Sharing Alternative Hypothesis

Not only do the data support the argument that share contracts mitigate the negative effects deriving from moral hazard, they provide only weak support of the competing hypothesis that share arrangements emerge as a result of risk-sharing between the producer and the actor. In the principal-agent framework, a risk neutral principal will bear all of the risk when there is no potential of moral hazard on the part of a risk averse agent. When a project is risky *and* there is a threat of moral hazard, the principal will balance the incentive effects (by increasing the share

offered to the agent) against the risk (by reducing the share offered to the agent, thereby lessening the risk burden). Holding incentive effects constant, an agent is less likely to receive a share the more risky the project. If we relax the assumption of risk neutrality proposed in Section I, and assume that the producer is risk neutral and the actor risk averse, then an actor will be less likely to receive a share contract the more risky the film project is *ex ante.*

The riskiness of a film revolves around the nature of the film itself. If a film is a SEQUEL, the producer and actor will perceive this as a less risky project. An actor should be more likely to receive a share contract if the film is a SEQUEL. The results in Table 1 do not support this prediction. Furthermore, players will base their risk assessments on the genre of the film, by looking at the variance of past (real) revenues of films by genre. Descriptive statistics from a sample of films, subdivided into genre, suggest that the variance in real revenues is largest for dramas, then action films, then comedies.[27] A share contract is most likely to emerge for a comedy, then for an action film, then for a drama. Therefore, the COMEDY coefficient should be positive, the DRAMA coefficient should be centered around zero, and the ACTION coefficient should be negative. The results in Table 1 support the COMEDY and DRAMA implications; however, the ACTION variable, although negative, is insignificant.[28] The data provide weak support of the risk-sharing hypothesis.

The support of the risk explanation is further undermined by the following argument. Consider the validity of the risk averseness assumptions proposed in this subsection. The producer, as principal, was assumed to be risk neutral. However, the producer can be risk averse. And given that the expected wealth of a big-name actor over his career can be quite large (tens of millions of dollars), the size of the actor's payment from this current contract may be so small

relative to his lifetime expected wealth, that he essentially acts as a risk neutral player. If the producer is risk averse and the actor risk neutral, the empirical implications will be the opposite of those just described.[29] Under these assumptions, the signs and significance levels of SEQUEL, ACTION, and DRAMA do not support the risk argument. The sign and significance of COMEDY refutes the risk-sharing alternative hypothesis.

IV. CONCLUSION

Evidence from contracts between actors and producers in the motion-pictures industry suggests that producers choose contracts which mitigate the negative impact of moral hazard. Contract length and actor's experience are positively related to the likelihood of a share payment being offered to an actor, while the genre of the film can have a significant impact on contract choice. Prior collaborations are more likely to lead to share arrangements for actors, as are larger degrees of Oscar recognition. Furthermore, the data provide only weak support of the risk-sharing explanation of the choice of optimal contract design.

Future research on these contracts would involve examining the role of an upfront payment that is present with some of these sharing agreements. Does the fixed payment serve as a risk premium for the actor? Additionally, it would be instructive to determine what *portion* of an actor's payment is fixed, as compared to the portion subject to the uncertainty surrounding the success of the film. The data employed in this study may facilitate an empirical examination of these lines of inquiry.

Table 1 Hidden Action and Hidden Information Logit Analysis

Variable	Mean	Standard Deviation	(I)	(II)	(III)	(IV)	(V)
CONSTANT			-378.89 (-1.675)	-342.88 (-1.932)*	-234.79 (-1.409)	-210.97 (-1.580)	-0.74864 (-0.009)
COMEDY	0.32203	0.46925	3.0666 (1.305)	2.4104 (1.270)	5.0277 (2.206)**	3.7502 (2.133)**	2.5469 (2.302)**
DRAMA	0.44915	0.49953	0.29929 (0.210)	0.76223 (0.605)	2.0347 (1.499)	1.4809 (1.342)	0.29206 (0.355)
TREND	1975.1	9.0088	0.18700 (1.648)	0.16987 (1.902)*	0.11414 (1.361)	0.10325 (1.533)	-0.18003E-02 (-0.043)
GENDER	0.23729	0.42723	-4.8732 (-2.083)**	-2.3649 (-1.654)	-4.6741 (-2.435)**	-3.2744 (-2.457)**	-2.3782 (-2.491)**
LENGTH	15.882	13.038	0.14647 (2.463)**	0.10695 (2.413)**	0.11147 (2.645)**	0.86245E-01 (2.512)**	0.52450E-01 (1.973)*
SEQUEL	0.11864	0.32475	-1.0292 (-0.475)	-0.97888 (-0.547)	-0.38805 (-0.210)	-1.2062 (-0.778)	0.72417 (0.675)
OSCAR	1.9661	2.7267	0.33947 (1.378)	0.33025 (1.493)	0.46981 (1.838)*	0.39444 (1.920)*	0.31527 (2.090)**
TEAM	0.27723	0.44986	4.5248 (1.790)*	2.5326 (1.513)	3.2439 (1.809)*	2.4828 (1.843)*	1.0614 (1.291)
ACTEXP	17.271	15.212	0.17710 (1.809)*	0.13474 (2.003)*	0.13642 (1.887)*	0.10989 (2.019)*	0.59979E-01 (1.678)*
PASTREV	0.39429E+08	0.52159E+08	0.31975E-07 (1.772)*	0.19397E-07 (1.844)*	0.25676E-07 (1.910)*	0.17037E-07 (1.691)*	0.73815E-08 (1.151)
HOLIDAY	0.11017	0.31444	8.0327 (1.973)*	1.5324 (0.847)	6.4903 (2.173)**	3.4024 (2.246)**	2.7673 (2.225)**
SHARE (Dependent)	0.39831	0.49164					
SAMPLE SIZE			44	52	53	62	80
% CORRECT PREDICTED			.84091	.807692	.830189	.82258	.78750
LIKELIHOOD RATIO TEST 11 DEG. OF FREEDOM			34.32793	35.76906	40.79319	41.51492	37.22752

I: Estimation Core Data
II: Two-Stage Estimation: Length (Completion Date)
III: Two-Stage Estimation: Past Revenues
IV: Estimation of Past Revenues and Length (Completion Date)
V: Estimation of Past Revenues and Length (Mean)
t-ratios in parentheses
Means and Standard Deviations are computed from entire sample, using observations for which the actual values are known.

Significant beyond 1% level***
Significant beyond 5% level**
Significant beyond 10% level*

Endnotes

1. The remaining periodicals included: *The Los Angeles Times; The Los Angeles Herald-Examiner; Los Angeles Magazine; People; Cosmopolitan;* and *Us.*

2. The assumption of risk neutrality will be relaxed in the *Risk-Sharing Alternative Hypothesis* subsection. The actor's effort is assumed to positively influence the commercial success of the film, thereby limiting the scope of the model to actors with leading roles.

3. These results follow from the principal-agent and transaction-cost literature, including: Coase (1960); Cheung (1969, 1983); Alchian and Demsetz (1972); Klein, Crawford, and Alchian (1978); Holmström (1979, 1982); Williamson (1979); Hart and Holmström (1985); Barzel (1989); Dutta and Radner (1991); and Khalil and Lawarrée (1993). In response to this literature, a body of empirical contract analysis has developed, including: Joskow (1987); Crocker and Masten (1988); Leffler and Rucker (1991); Allen and Lueck (1992, 1993); LaFontaine (1992); Gibbons and Murphy (1992); and Crocker and Reynolds (1993).

4. The marginal legal cost of drafting and enforcing a fixed-payment contract is relatively small. The Screen Actor's Guild, for example, provides a Minimum Free Lance Contract. This two-page standardized form only requests the following information: the date; the names of the producer and the actor; the actor's role; the working title of the film; the actor's payment; the duration of the employment relationship; the address of the actor; the starting date of the actor's next job; and both parties' signatures. (See Beil *et al.* (1980) at 107-8 for a sample contract.)

On the margin, the legal costs of a share contract can be quite significant. Consider the case in which the actor's payment is tied to the profit of the film. Many resources will be spent on simply answering the questions raised as profit is defined *ex ante.* For example, do the total revenues include theatrical revenues, ancillary revenues, and foreign theatrical revenues? Do the total costs include "negative" costs, interest on negative costs, and distribution expenses? ("Negative" costs in the movie industry refer to overhead costs, studio charges, fringes charged to the picture, and over-budget penalties. See Megal (1982).) Regarding interest payments on negative costs, at what point in the accounting period does interest start to accumulate? There is also room to exploit the incompleteness of the definition of revenues and profits *ex post,* giving rise to enforcement costs (i.e., costs of litigation). And the larger the share, the more resources *both* the producer and the actor will devote to defining profits in their own favor.

5. *The Academy Award Index: The Complete Categorical and Chronological Record,* (Richard Shale, Westport: Greenwood Press, 1993) was also consulted.

6. See Klein and Leffler (1981) and Gibbons and Murphy (1992) for detailed discussions of the reputational effects of career concerns.

7. The length of the contract is assumed to be determined prior to contract negotiation.

8. "Rentals" reflect the portion of the boxoffice take which distributors receive.

9. This is in contrast to a comedy, in which the comic lead often works with a "straight man."

10. The genre for eight of the films required examination of the following sources: *An Anthology by the National Society of Film Critics* (Hollis Alpert and Andrew Sarris, New York: Simon and Schuster Publishing, 1969); *John Willis' Screen World, Volume 27* (New York: Crown Publishing Inc., 1976); and *Variety* (May 18, 1960 and May 22, 1968).

11. Compression of film genres into these three categories affected 21 films. Mysteries were assigned to the DRAMA category; westerns to the ACTION category; and musicals to the DRAMA or COMEDY category, depending on the particular film. There were five mysteries, eight westerns, and eight musicals.

12. The percentage of lead and principal roles was computed by examining a subsample of cast lists for films in this data set. Cast lists document a given film's lead and principal performers.

13. One release date was determined by consulting *Variety,* June 24, 1981.

14. The following are considered important holidays for the motion-pictures industry: Memorial Day; Independence Day; Thanksgiving; and Christmas. The purpose of including this variable is to *control* for timing effects. One should be cautious with making predictions about this variable, since the release date may change (Chisholm (1994)).

15. This limitation further precludes employing a Cragg hurdle model (Cragg (1971)). Such a model would allow for testing whether the decision of choosing a share versus a fixed payment differed from that of choosing the size of the share.

16. The number of observations missing explanatory variables were as follows: LENGTH (50); PASTREV (42); TEAM (17). Note that since some observations were missing more than one variable, there was overlap, leading to fewer observations being excluded than the sum of observations described here.

17. Apparently, in 1989, *Variety* switched to collecting a Top 40 Chart rather than a Top 50 Chart.

18. The signs of all of the coefficients remained the same as in Table 1, Regression I. The significance of some variables changed marginally as follows, with the change in t-ratios noted in parentheses. COMEDY became significant (1.305 to 1.745), and TEAM became insignificant (1.790 to 1.574). All other variables that were significant remained significant, and vice versa.

19. The remaining 38 data points were excluded due to lack of information on only the TEAM variable (12 observations), on only the PASTREV variable (21 observations), or on both (five observations). The selection bias introduced by the exclusion of these remaining observations is addressed in the *Interpretation of Results* subsection.

20. The HOLIDAY variable was included simply to control for any timing effects the films' release dates might have on contract design. In spite of this variable's significance, the result should be interpreted in a qualified manner. Before a film is produced, there is an expectation of when the release date will be; however, there may be uncertainty surrounding this variable *ex ante.* See Chisholm (1994) for a preliminary empirical analysis of the release-date choice.

21. Note, however, that in Regression V, 26 observations were excluded due to lack of data on PASTREV. Does this exclusion introduce a selection bias in the results presented in Table 1? Two sources of data were employed for collecting past film revenues. The *Rental Champs* list excluded films that grossed less than three million nominal dollars; *Variety's Top 50* list, in the format used for data collection, went back only to 1969. Of the 26 observations missing past revenues, only one involved a film produced since 1969. Therefore, since nominal film revenues were significantly lower in the 1950s and 1960s, it is not clear that the missing *real* revenues are necessarily biased downwards. If a film did not appear on the *Rental Champs* list, this does not imply that the film bombed in real terms. A film not appearing in *Variety's* weekly listings may simply correspond to the fact that it was produced before 1970. The fact that an observation is missing, therefore, does not produce a clear bias on PASTREV in either direction. The singular observation missing revenue data on a past film produced in 1988 would bias the PASTREV upward, but only slightly.

Since films may be re-released, the PASTREV variable may be biased downward, strengthening the results in Table 1. However, empirically, the annual percentage of re-releases in the U. S. first-run market is insignificant. For example, according to *Art Murphy's Boxoffice Register,* the percentages of major releases in U. S. movie houses that were re-releases are as follows: 2 percent (1986); 4 percent (1987); 2 percent (1988); 4 percent (1989); 3 percent (1990).

22. Note, however, that in Regression V, 17 observations were omitted due to lack of information on the actor's and producer's prior collaborations. In all instances, this lack of information was driven by the fact that the filmographies for the producers were unavailable, after consulting several film biographical sources, including: *International Motion Picture Almanac (various issues); The Film Encyclopedia; The International Encyclopedia of Film; Dictionary of Film Makers; The Illustrated Who's Who of the Cinema; World Film Directors; Director's Guild of America Inc. Directory of Members: 1980-1981.* For observations for which the TEAM variable is missing, therefore, it is likely that the actor and producer have not worked together before, since the producer was relatively unknown or perhaps just starting her career. Therefore, the TEAM coefficient may be biased upward, diminishing the strength of the finding.

23. Since films were classified as ACTION, COMEDY, or DRAMA, the omitted variable, ACTION, was implicitly incorporated in the CONSTANT term. When the five regressions were run explicitly accounting for ACTION, and subsuming the DRAMA effect in the CONSTANT term, the coefficient on ACTION was negative in all cases, but insignificant. The sign of the coefficient is consistent with the model.

In order to fully consider the impact that the genre of a film might have on contract design, one could further examine the disincentives to the actor of genre-switching. Before entering a contract, an actor may have a history of performances corresponding to a particular genre of film. If the current film involves a genre switch, the actor will require an added incentive to work hard at this new genre. If his payment is not tied to the output, he may choose a lower level of effort, knowing that the reputational effect on future employment in films of his original genre may be minimal. Regressions I-V were re-estimated, replacing specific genres with a SWITCH dummy, equal to one if the actor was switching genres by entering the current contract, and zero otherwise. The coefficient on SWITCH was positive in all five regressions, but insignificant.

24. That is, in each of the six cases for which the current and the previous contracts were known, the current contract was dropped from the data set.

25. In fact, the significance level of ACTEXP improved, with the t-ratio changing from 1.678 to 1.916.

26. The one actor appearing the most in the entire data set (over 118 observations) was Sylvester Stallone, with seven observations (the frequency was lower in subsamples of the data set). The Regressions in Table 1 were run using a subsample which excluded observations on Stallone, to test for any influence his contracts may have had on the results. The SEQUEL variable was dropped, since Stallone was involved with four of the fourteen sequel contracts, introducing possible multicollinearity in the logit analysis, *vis-à-vis* the SEQUEL dummy. (HOLIDAY was dropped for a similar reason.) The exclusion of the SEQUEL variable was further justified since, in Table 1, it was found to be an insignificant predictor of contract choice. The notable difference between Regression V in Table 1 and in this subsample was that the TEAM coefficient became significant, and the ACTEXP coefficient became insignificant (both retaining their positive signs). TREND was still insignificant, although its sign changed from negative to positive. The remaining coefficients retained their signs; COMEDY, GENDER, LENGTH, and OSCAR remained significant.

27. These descriptive statistics were computed from two samples, both of which resulted in the same ranking of riskiness. The first sample used (inflation-adjusted) revenues, by genre, on the most-recent films of actors, for the case in which these data were available in the *Rental Champs* list. The second sample used (inflation-adjusted) revenues, by genre, reinstating missing-revenue observations by the two-stage estimation technique described for Regression III.

28. See Endnote 23 for a discussion of the regression results that include the ACTION dummy explicitly, and subsume the DRAMA dummy in the CONSTANT term as the omitted variable.

29. In fact, as long as the producer is more risk averse than the actor, the empirical predictions will be the opposite of those just described.

Appendix: List of Actors and Actresses Represented in Core Logit Regression I

Woody Allen
Julie Andrews
Dan Aykroyd
Marlon Brando
Sean Connery
Tom Cruise
Danny DeVito
Kirk Douglas
Tom Hanks
Audrey Hepburn
Dustin Hoffman
Diane Keaton
Alan King
Jack Lemmon
Steve McQueen
Rick Moranis
Bill Murray
Paul Newman
Olivia Newton-John
Jack Nicholson
Al Pacino
Harold Ramis
Robert Redford
Christopher Reeve
Burt Reynolds
Arnold Schwarzenegger
Sylvester Stallone
Barbara Streisand
Elizabeth Taylor
John Travolta
Sigourney Weaver

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